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# **Do Taxes Matter?**

## **A Review of the Effect of Taxation on Economic Behavior and Output**

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Taxes that are moderately distorting are potentially the most damaging because their effects may be substantial yet go unnoticed.

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Taxpayers are most concerned about the private burden (costs) of taxation as measured by what they pay to the government. However, taxes can generate a net gain to society if governments use the revenues wisely. Economists, on the other hand, are more concerned about the social burden (costs) of taxation independently of the way in which the revenue is used. Taxes change prices and factor returns (wage rates, the rate of return on capital, and so on). When taxes are imposed, consumers and producers try to avoid the tax by consuming or producing less of the taxed item (good, activity, or income). The extent of avoidance accelerates with increases in the tax rate. This distortion of taxpayer behavior reduces their welfare and results in a net ("deadweight") loss to society when markets are functioning well.

To illustrate this broader welfare notion of the economic inefficiency of taxation, some heuristic examples are chosen, first from historical and then from more recent accounts. It is shown that in some cases the behavioral effect of taxation is dramatic (for example, in production,

trade, and consumption) while in other cases the evidence is mixed (for example, in savings and investment). In general, very low tax rates have little impact on economic behavior, while very high tax rates generate efficiency costs that nobody can ignore. However, when taxes are moderately distorting, they have the greatest potential to damage as their welfare effects are likely to be substantial but difficult to measure quantitatively.

The latter half of the paper reviews the literature on a more direct but narrower measure of the incentive effects of taxation: how do taxes affect output growth rates? Some new evidence on this issue is provided using a comprehensive sample of 111 countries. Empirical estimates from this cross-country data show the growth rate of output to be negatively correlated with the level of government spending but positively correlated with the growth rate of government spending. Estimates of the effect of tax rates on output growth rate are also mixed: they are sometimes negative, sometimes zero.

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**A Review of the Effect of Taxation**  
**on Economic Behavior and Output**

by  
**Johnathan Skinner**

**Table of Contents**

<b>I. Introduction</b>	<b>1</b>
<b>II. Why Taxes Cause Efficiency Losses</b>	<b>4</b>
<b>III. Taxation and Economic Behavior</b>	<b>10</b>
<b>IV. Output Growth and Taxation</b>	<b>39</b>
<b>V. Conclusion</b>	<b>53</b>
<b>Bibliography</b>	<b>56</b>

## I. Introduction

Taxpayers often view the primary burden of taxation to be the amount they hand over to the tax collector. The obvious cost of taxation to the consumer is the lost income and higher prices of taxed goods; to producers it is the foregone profits and lower after-tax product prices. Throughout recorded history, citizens have registered their complaints against the taxes they pay with "murmurs and with smothered curses among them from hatred of the burden."<sup>1</sup>

This paper will stress that the tax bill that taxpayers grumble about -- the private cost -- has little to do with the full social costs of the tax. The reason is that from a social point of view, money collected from the private sector is equal to the money gained by the public sector (less administrative costs). It is certainly possible that the government programs financed by this revenue, such as education, health, or transportation, will provide to the average taxpayer the same, if not more, than the benefits that would have been realized had the taxes never been collected. To the extent that the government uses the tax revenue wisely and effectively, the loss of the private individual's tax payment can yield a greater gain to society. Of course, it is not surprising that taxpayers seek to avoid paying taxes, since their payments will have little effect on their own benefits from government spending.

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<sup>1</sup>The quotation is from a 15th century writer observing taxpayers' reactions to the taille in England (Sabine, 1980; p. 55).

This paper will focus primarily on a different type of cost. Private citizens bear the burden of this cost of taxation, but there is no offsetting revenue gained by the government. Without the offsetting gain, there is a "deadweight" cost to society as a whole. These costs are in some sense abstract, and more difficult to measure, but they are important because they reduce the well-being of consumers or drag down the productive capability of the economy. The goal of any tax system should be to minimize these costs, given the revenue that the government must raise.

It is useful to categorize these subtle costs of taxation into three groups. The first is the efficient cost of a tax. Such costs do not appear in government budget statements, but are costs nevertheless. They are caused by the distortion in taxpayer's behavior caused by the tax-induced changes in prices and wage rates. For example, a payroll tax may discourage salaried work, and thereby reduce the productivity of the labor force. A tax on capital income may reduce savings and hence investment. Because the government cannot collect any taxes on the foregone labor, or the foregone savings, it loses revenue. Because the individual no longer enjoys the benefits of the wages from the foregone work, or the proceeds of the savings, he or she is worse off. Hence the government loses potential revenue and the taxpayer is worse off.

Another cost of taxation is the administrative, compliance, and avoidance costs from collecting it. Strictly speaking, the administrative cost is observable; one need only check the yearly budget to measure how much the government spends to collect revenue.

But administrative costs may be only a fraction of compliance costs (accountants hired to fill out tax forms) or avoidance costs (fast boats and circuitous routes to smuggle goods into the country). These latter two costs still represent "leakages"; the use of otherwise productive resources in unproductive, tax avoidance or compliance activities.

Costs may also be expended on bribery and other forms of direct income transfer to avoid paying taxes. While such activities do not place a drain on resources per se, they do lead to a most undesirable distribution of income away from the public treasury and towards the more corrupt officials, and towards a general breakdown of professional standards in tax administration. It is important to note that while corruption harms the economy, it does so in a way which is different from the social costs discussed above.

The final cost of taxation relates primarily to the turmoil which surrounds any change in the tax code. Companies which are unsure about future tax provisions may assume the worst and cancel investment plans, despite the best intentions of the host country. These are, once again, costs borne by taxpayers which yield no extra revenue for the government.

One goal of this paper is to provide a partial review of the deadweight or social costs of taxation. The review is very selective, and picks out readily apparent examples of deadweight costs. That is, it focuses on obvious examples or vignettes to illustrate and enliven the usual abstract measures of efficiency cost. Another goal is to determine whether these "deadweight" costs

of taxation have an ultimate effect on national output. In particular, recent papers (Marsden, 1983; Landau, 1986; Skinner, 1988; Engen and Skinner, 1989; Koester and Kormendi, 1988) have stressed the negative impact of taxation on output growth rates. A sample of 111 countries is used to examine whether there are readily apparent relationships between fiscal policy and output growth rates.

Perhaps one reason why efficiency or "deadweight" costs receive little weight in policy discussions is because the notion of efficiency cost is so abstract and difficult to quantify. The next section therefore draws on a simple example of commodity taxation to illustrate what the efficiency cost is, and to distinguish it from smuggling costs. Section III provides a selective review of efficiency cost, and in particular draws on historical examples for illustrative purposes. Section IV presents evidence on the correlation between taxation and output growth rates, while Section V concludes.

## II. Why Taxes Cause Efficiency Losses

Because economists have focused on efficiency as the guiding principle for tax design, it is useful first to provide a simple description of the efficiency cost of taxation. I focus on one example, that of a commodity tax on bicycles, but the principles of efficiency cost extend quite generally to other types of taxes as well.

Consider the case of the tariff on bicycles in a hypothetical

developing country. Assume that the before-tax price of bicycles, which must be imported, is \$80. The import tariff in at least one developing country is 70 percent, bringing the total price to \$136.

I will assume that farmer is willing to pay \$80 for the bicycle, but is unwilling to pay the full \$136 price. In fact, this farmer will pay up to \$100, but blanch at any price higher.

What is the efficiency cost of this tax? It is quite easily calculated. Without the tax, the farmer would buy the bicycle for \$80. Since he would have paid \$100 for the same bicycle, he enjoys a "consumer surplus" of \$20; the excess of what the bicycle is worth to him (i.e., what he would have paid) over the price actually paid.

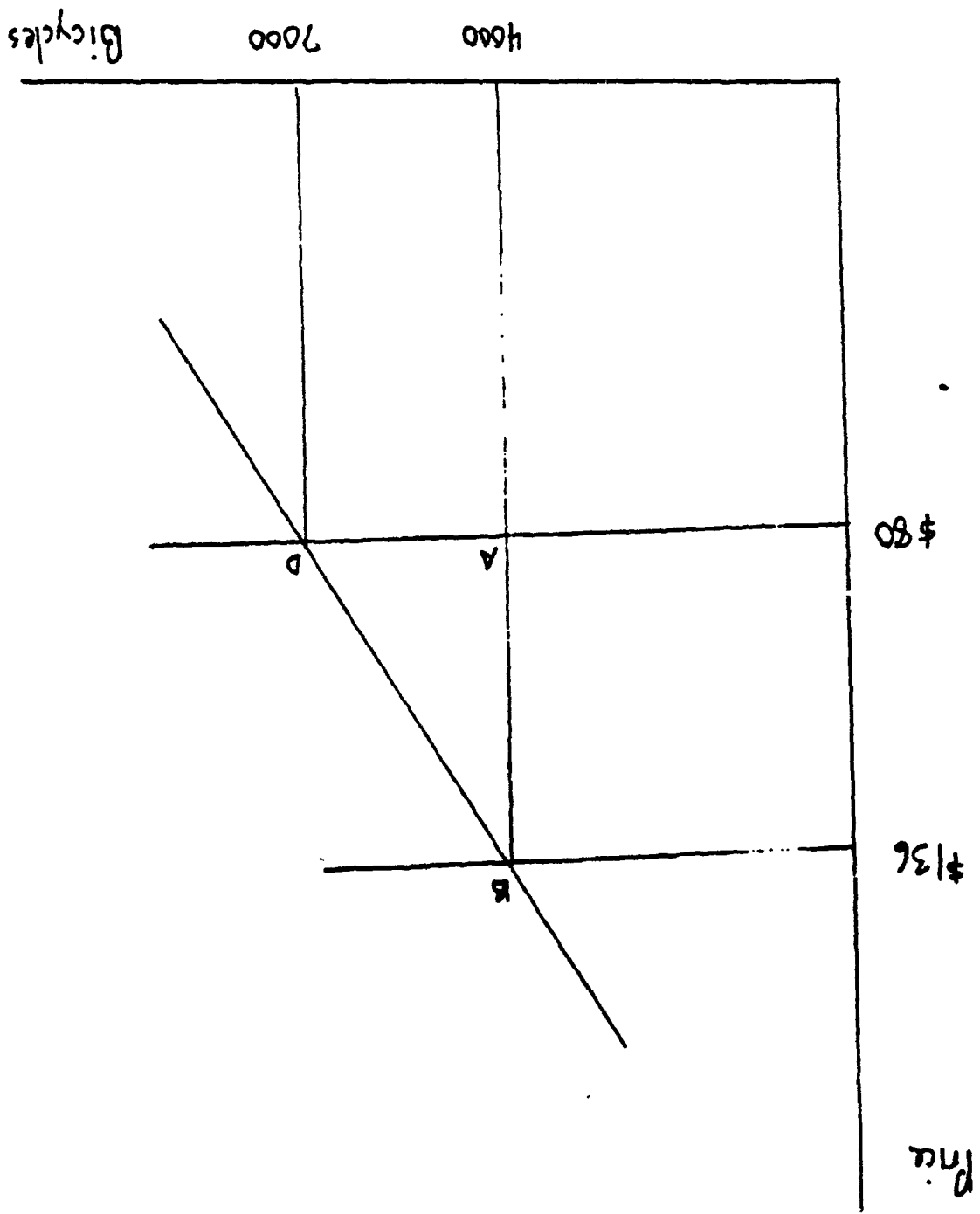
When government imposes the 70 percent tax, the farmer no longer purchases the bicycle, and no longer enjoys the "consumer surplus" of \$20. The government collects no additional revenue (at least from this potential taxpayer); since the bicycle is not purchased, no taxes are paid. The farmer loses \$20 and the government gains nothing.

This story which applies to only one individual can be generalized to the countrywide market for bicycles. Some will be willing to spend more than \$100 (or even more than \$136), while others are willing to spend less. We can array each individual looking for a bicycle during the year as in Figure 1, with the vertical height being the maximum each farmer is willing to pay (i.e., the demand curve). The numbers are based loosely on trade data from one African country.

Assume 7000 bicycles will be sold without any tax. If there is



Figure 1: Excess Burden of a  
Tax on Bicycles



a tax of 70 percent, then only those who value the bicycle above \$136 will buy it; assume this is a total of 4000 thousand.<sup>2</sup> The efficiency cost of the tax can be calculated in the following way.

Assuming that each person only buys one bicycle, there are 3 thousand individuals who have been discouraged from buying a bicycle because of the tax. The individual right at the margin of buying a bicycle with the tax might have valued the bicycle at \$135.98. Hence his consumer loss is  $\$135.98 - \$80 = \$55.98$ , or the consumer surplus he would have enjoyed, had there been no tax. The next individual might value the bicycle at \$135.96, so that his consumer surplus would have been \$55.96. We may perform this calculation for all the 3,000 individuals who would have bought the bicycle. The sum of all the losses is the area of the triangle denoted by BAD in Figure 1. The area of this triangle is measured by one-half the amount of the tax (\$56) times the change in quantity demanded for the product (3,000), or \$84,000.

The efficiency cost of \$84,000 is a clear loss to society. The magnitude of this loss is more than one-third of the revenue (which is  $\$56 \times 4000 = \$224,000$ ). What this means is that on average, every \$1.00 in revenue collected by the government causes a loss to consumers of \$1.33; \$1.00 in the revenue actually paid plus \$0.33 in foregone "consumer surplus" from the enjoyment of a commodity which would have been purchased had there been no tax.

The calculation reported above determined the average

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<sup>2</sup> The slope of the demand curve is therefore  $dQ/dP = -53.6$ , which is used in subsequent calculations.

efficiency cost of the tax as a fraction of the revenue. A different measure would be the marginal efficiency cost; what is the change in the efficiency cost if government revenue is increased by a certain dollar amount. For example, if the bicycle tax were raised from 70 percent to 80 percent, the price would increase to \$144. If, in turn, quantity demanded fell to 3,570, then the change in revenue would be \$4,480 (\$228,480 - \$224,000); but the efficiency cost would increase by \$25,760 (\$109,760 - \$84,000). In this case, the efficiency cost increase is more than 5 times the tax revenue increase. For the tax increase to be justified on efficiency grounds, each dollar spent must return more than \$6 in social benefits.

Finally, if there were smuggling of bicycles, the government would find that not only would lower tariffs increase bicycle purchases, but it also might reduce the amount of smuggling. Shifting the importation of bicycles from illegal to legal channels may have little effect on the domestic use of bicycles, but it will have a positive impact on the government's revenue. For example, when Bangladesh decreased its tax on fabrics from 200 to 100 percent, legally imported fabrics more than doubled, so that revenue actually increased. It is unlikely, however, that domestic consumption more than doubled; what is more likely is that smuggled fabrics became legally imported fabric, which shifts income from smugglers to the government.

Efficiency costs are present when producers are taxed. The most obvious examples of the deadweight or efficiency cost of a

producer tax comes from countries such as Tanzania and Ghana, where heavy export taxation (either implicit or explicit) have squeezed agricultural production, leading to a sharp fall in output, foreign exchange earnings, and tax revenue (see the World Development Report, 1986). Once again, producers lose because they are producing less under the tax, but the government gains no extra revenue from the reduced production activity. When export taxes affect such an important component of the economy (especially once the linkages with the rest of the economy are accounted for), it seems clear that the taxation of agricultural output caused a substantial decline in national output.

One point should be made here. In many socialistic countries, there is little or no weight placed on "consumer surplus"; taxes which discourage the use of, e.g., luxury or decadent capitalistic goods are thought to be socially beneficial. Such taxes prevent citizens from placing private over social responsibilities. However, even socialistic countries should avoid distortionary producer taxes, since more (of the socially correct commodities) is still preferred to less.<sup>3</sup>

These simple examples have provided illustrations of the efficiency cost of taxation. It is a further question how efficiency cost can be measured, and whether there is convincing

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<sup>3</sup>I am neglecting here the issue of the incidence of the tax. Producers of decadent capitalist goods may be taxed in lieu of taxing consumers directly; the same outcome -- a reduction in output of the commodity -- will occur.

evidence that efficiency costs are large and important. It is to this issue that we turn next. First, selective evidence for a variety of tax instruments is presented, from both developed and developing countries. As noted above, this evidence is chosen for its illustrative or pedagogical value; no attempt is made to make an exhaustive survey of taxation and incentives.

### III. Taxation and Economic Behavior

The following section reviews the evidence about how taxation affects economic incentives. Because different tax instruments will have different effects on behavior, each tax is discussed separately.

#### Trade Taxation

Import and export taxes have been the principle method of collecting taxes for countries in early stages of development. The ease of administering a tax collected at only a few entry and exit ports explains trade taxes' popularity. Yet early on, governments recognized the costs of excess customs duties. For example, an unnamed commissioner in the 18th century English customs shared this advice;

I will tell you a secret, which I learned many years ago from the commissioners of the customs in London: they said when any commodity appeared to be taxed above a moderate rate, the consequence was to lessen that branch of the revenue by one--half; and one of these gentlemen pleasantly told me that the mistake of parliaments on such occasions was owing to an error of computing two and two make four; whereas in the business of laying impositions, two and two never made more than one....[Smith, 1976: (ii) 411]

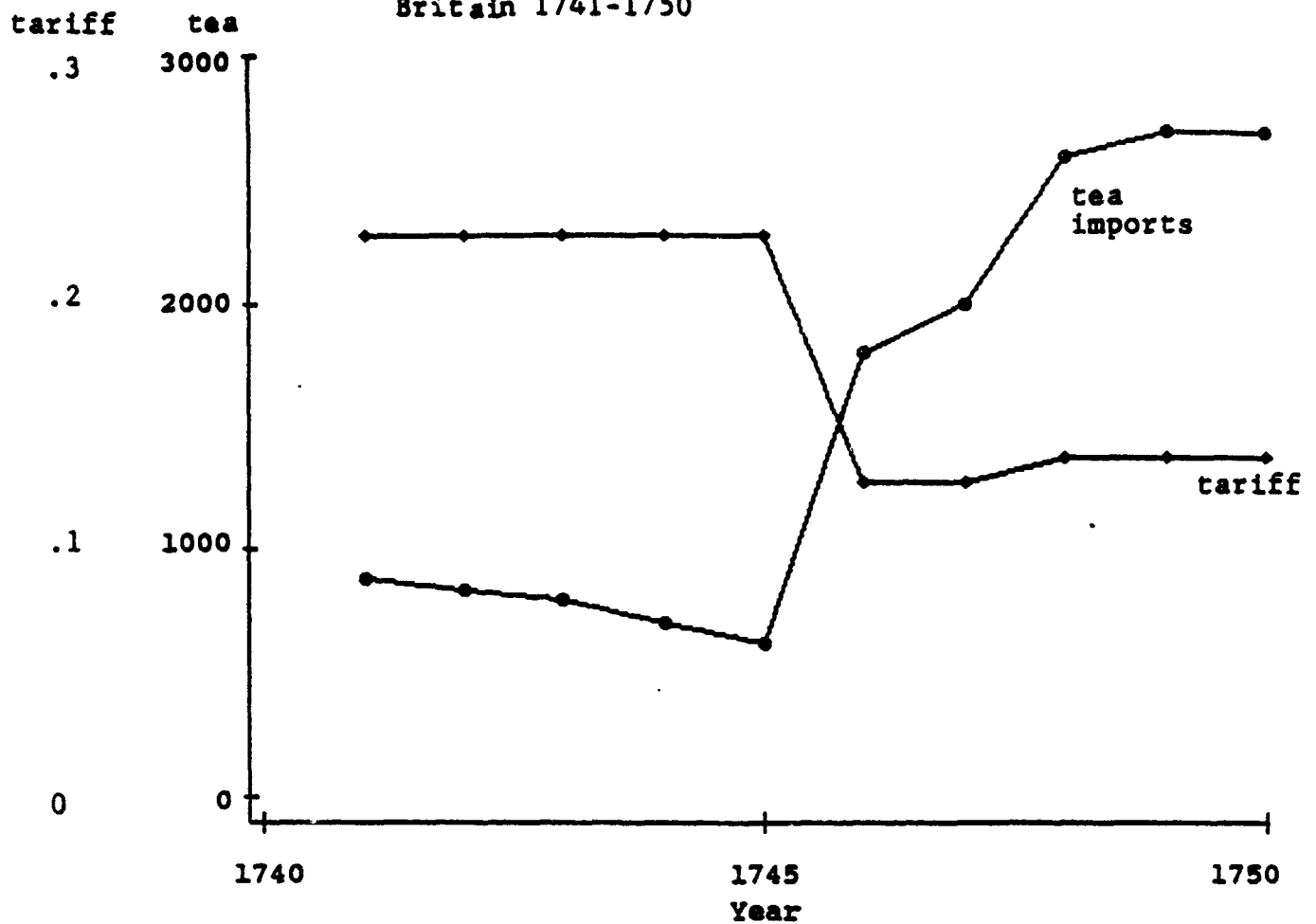
What is lurking in the commissioners' mind is an early precursor of the "Laffer" effect; that revenue may even fall if tariffs are raised. It is only in the extreme case that revenue will decline when tariffs increase, but the principle -- that taxes can have a strong impact on the quantity of legal imports -- is emphasized here. There are two reasons why revenue may suffer in response to a tax increase. The first is that the tax discourages imports, leading to a decline in consumption of the good. The second cost is the erosion of tax revenue through smuggling. This is a different type of cost; the smuggled good is still consumed, but at higher resource costs for extra-legal transportation (and associated anti-smuggling resource costs).

Additional evidence in favor of the strong price sensitivity of imports comes from the reduction in British tariffs on tea after 1745 reported by McCulloch (1845), and depicted in Figure 2. The effective average import duty, and total imports, are reported for each year between 1741 and 1750. In 1745, the tea tariff was reduced by more than 50 percent, with a pronounced effect on importation of tea.<sup>4</sup> It seems clear in this case that much of the increased importation of tea was due to a reduction in smuggling, although consumption of tea is likely to have increased as well.

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<sup>4</sup>One should always be wary of using event studies to make inferences about whether A affects B, since other factors which changed at the same time may have affected B as well. However, the dramatic change in imports over such a short period at a time when the tax rate has changed provides strong evidence in favor of the inference that the lowered tax rate increased tea imports.

Figure 2: Tariff Rates and Imports of Tea,  
Britain 1741-1750



Source: McCulloch (1845), page 332. Tea is measured in thousands of pounds

Nevertheless, the income transfer from smugglers who previously could pocket the smuggling premium, to consumers paying lower prices, is a laudable social goal in itself.

Not all goods will respond so readily to tax cuts. These illustrations are provided to show the extreme degree of distortions that taxes are capable of imposing. In most cases, reducing tax rates will lead to increased consumption (and production) of the good in question, which reduces the social efficiency cost, but revenue will generally fall in response to the tax cut. There are a few exceptions; Lindsey (1987), for example, suggested that the decline in the U.S. capital gains tax actually increased tax revenue during the early 1980s. The evidence is strong, however, that such "Laffer" effects are rare anomalies (for a review, see Fullerton, 1982). The point remains that even if a tax cut does not increase revenue, it will increase consumption of the good and, to the extent that consumption of the imported good is deemed socially desirable, augment national welfare.

McCulloch (1845) also pointed out the risks of assessing heavy export taxes for countries with market power in that export good.

The duty on cinnamon exported from Ceylon may be referred to in illustration of the mischievous consequences resulting from carrying duties on exports, even when the exporting country has great facilities of production on her side, to an unreasonable extent....This [export] duty was sure,... to prevent the trade from extending; but it has done more than this: it has led to the introduction and successful cultivation of the cinnamon plant in Java. Guiana, and the West Indies; and it has also led to the general substitution of cassia in the place of cinnamon [pp. 197-198]



More recently, the impact of export taxes on agricultural output has been the focus of many World Bank studies, some of which are summarized in the 1986 World Development Report. The oft-cited experience of Ghana with export taxes on cocoa (either explicit or implicit, through marketing boards and fixed exchange rates) is a particularly dramatic illustration of the incentive effects of taxation. Like Ceylon many years ago, the monopoly position of Bangladesh in jute has been eroded as synthetic substitutes have been developed. The gains from monopoly pricing of export goods may be short lived.<sup>5</sup>

More recent studies of trade taxation have stressed the complex effects of import and export taxation on the entire economy. There are a number of simulation models which implement econometrically estimated parameters in general equilibrium models of particular countries (Clarete and Whalley, 1987; also see Shoven and Whalley, 1985). The excess burden of trade taxation is then addressed using a "counterfactual" -- what would be production and income if the existing tariffs were replaced by increasing other taxes so that government revenue is held constant? A comparison of real income, or of consumer utility, provides a measure of the excess burden of the tax. That is, these models can calculate the loss in consumer "surplus" caused by tariffs. The disadvantage with the simulation

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<sup>5</sup> Recent oligopolistic models of trade have emphasized the use of export subsidies or taxes to provide an advantage to the home country in the bargaining game over production and prices. See Eaton and Grossman (1986).

is that it cannot be tested, and the accuracy of the prediction is only as good as the assumptions embedded in the model.

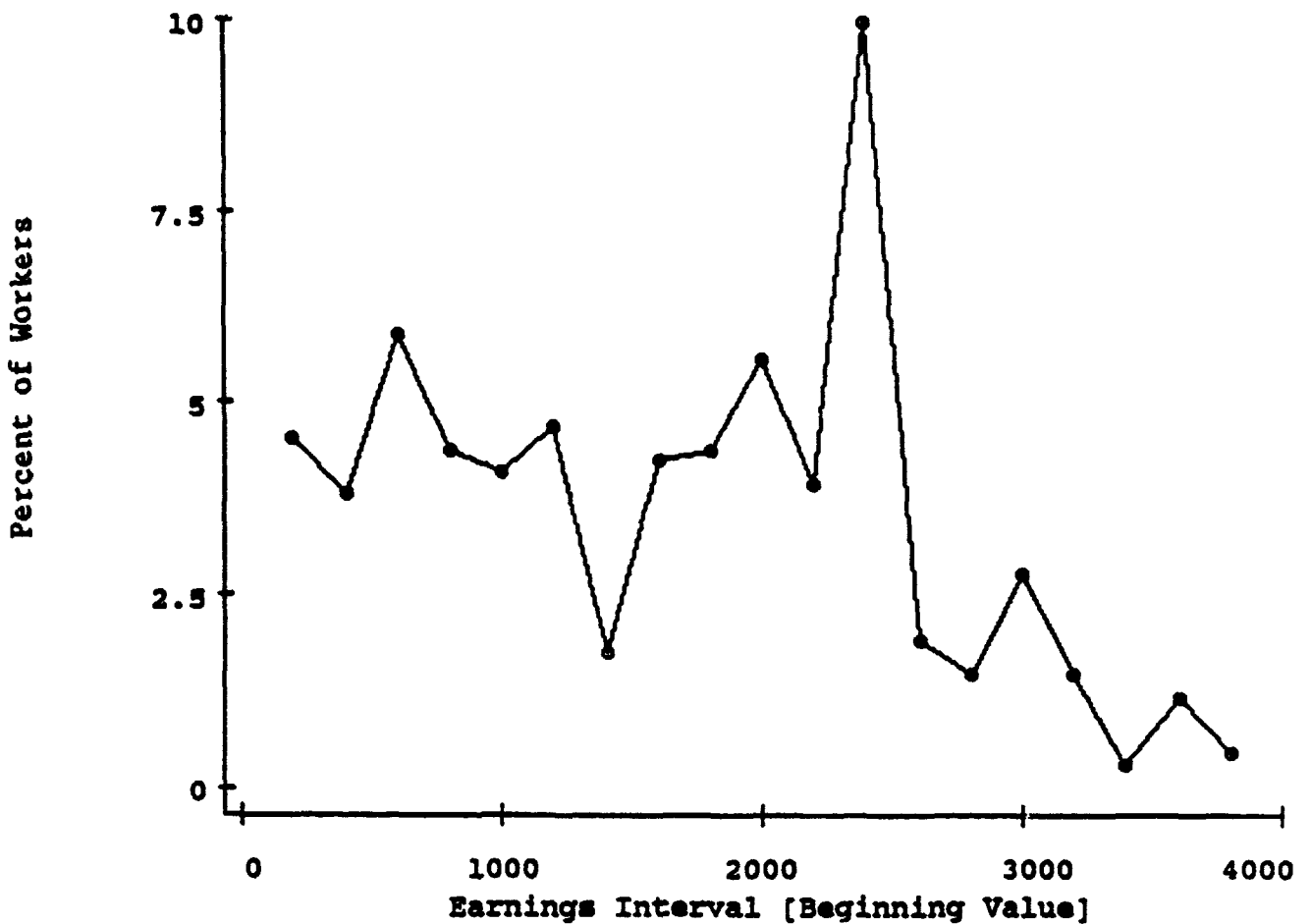
Some studies of tariffs in general equilibrium models have shown small welfare costs, in part because of the relatively moderate tariff rates and the minor importance of the taxed goods in national income. However, like the example of the bicycles discussed above, the marginal cost of increasing trade barriers are often substantial relative to the revenue collected. In particular, Clarete and Whalley (1987) calculated that the marginal efficiency cost of raising a tariff in the Philippines above 20 percent was in excess of 100 percent of the revenue raised. Of courses, their results depend crucially on the assumptions made about supply and demand elasticities.

### Payroll Taxation

There have been many studies of the efficiency cost caused by payroll taxes in developed countries. In general, the efficiency costs were found to be minimal, owing to low estimated elasticities of labor supply for men (for a review, see Killingsworth, 1983). Generally, the responsiveness of labor supply to its own wage is higher for married women, and for older and younger workers.

A graphic example of how payroll taxes affect hours of work is provided by data in Kotlikoff (1978). Figure 3 displays the frequency distribution of wage earnings for men over aged 65 in the US (not including the 32 percent earning over \$4000 dollars). The spike in the middle of the distribution occurs because wage earnings over \$2400 (in 1974) were implicitly taxed at a very high rate. For

Figure 3: Percent Distribution of Workers  
Aged 65-71: Males, 1974



Source: Kotlikoff (1978). Earnings intervals are \$200; 32 percent earned more than \$4000. The Social Security earnings limit is \$2400.

those enrolled in social security (the vast majority of the population), benefits were reduced by 50 cents for every one dollar increase in wage earnings over \$2400. The spike just under \$2400 suggests that if the tax had not been in existence, more hours would have been supplied. Once again, this "bunching" represents a net loss to society, since the potential workers limit their hours, which only deprives the government of revenue.<sup>6</sup>

Payroll taxes in developed countries are thought to cause efficiency losses because workers vary their labor supply in response to the net wage rate. This neoclassic view is viewed by Fields (1987) as irrelevant to developing country tax policy. He views labor demand in developing countries as being consistent with a dual market; the "modern" or urban sector pays a higher wage to otherwise identical workers than the traditional or rural sector. As a consequence, rural workers migrate to cities as long as the expected value of getting a highly paid job exceeds their agricultural wage rate (Harris and Todaro, 1970). In the Harris and Todaro model, higher urban wages cause a reduction in rural output (as migration to the cities occurs) and more unemployment. Hence taxes on labor in urban areas would have positive effects, since by reducing the net urban wage, migration and urban unemployment could be reduced.

The analysis above assumes that the tax is borne entirely by

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<sup>6</sup>Revenues include both payroll taxes on extra hours of work, and the potential reduction in social security benefits.

the worker, so that her net wage falls by the entire amount of the tax. Alternatively, the payroll tax could be passed along to consumers through higher prices. Since the payroll tax is often assessed on larger-scale companies in the "modern" sector, it could be viewed as a tax on this type of business organization. In sum, if the payroll tax is simply a tax on doing business for large scale companies, and if the tax is passed along to consumers (see Brent, 1986), then its distortion in developing countries is to artificially raise prices of some goods and potentially discourage the development of the taxed sector. The question remains as to what fraction of the payroll tax is passed along to consumers through higher prices. This is not known; for example, one might expect that prices of domestically produced goods which compete with internationally marketed goods would be relatively insensitive to payroll taxation.

#### Taxation of Investment and Savings

There is a substantial and growing literature on measuring the efficiency cost of investment and savings taxation in developed countries. The efficiency cost takes two forms. First, if the rate of return on savings is reduced, savers face lower interest rates. Holding overall tax revenue constant (so that the change is "compensated"; roughly speaking, the taxpayer's lifetime disposable income is held constant), consumers will consume too much and invest too little today, at the expense of future consumption.

The second problem associated with this tax is that it

attenuates the capital stock. Over time, as less investment takes place, the growth in the capital stock will fall, which (in a neoclassical model) will lead to a lower overall standard of living; national income and wages will both decline. Many studies of savings and investment taxation have focused on the impact of taxation on the dynamic path of capital growth.

The excess burden of a tax either on savings or on taxation will depend on how sensitive these factors are to taxation. At present, there is no consistent evidence that net-of-tax interest rates have a strong effect on savings rates. In the United States, Denison's Law -- that gross private savings was a constant fraction of GNP -- was once invoked as evidence that taxes and interest rates had no effect on savings rates. However, as Boskin (1978) suggested, the relevant measure of savings for tax policy purposes was net savings as a fraction of disposable income. (Furthermore, the observed fraction of gross private saving to GNP has diverged from its historical levels.) The results of econometric studies testing whether taxation, or the net interest rate, affect savings, are mixed (e.g., Boskin, 1978; Howrey and Hymans, 1978). There have been a number of recent studies in savings behavior for developing countries (for a survey, see Balassa, 1988); in general, these studies have found a positive interest elasticity of saving, but the results appear sensitive to which country is chosen. As Balassa (1988) and Mikesell and Zinser (1973) have pointed out, estimating the interest elasticity of saving from developing country data (even if it does exist) may be difficult owing to the imperfectly measured

national income accounts. Thus studies which have found no interest elasticity of saving may have used data too weak to reveal it. On the other hand, specification searches over savings rate regression equations which stop once the interest rate coefficient becomes positive and significant could bias the literature in favor of finding a positive saving elasticity (Leamer, 1978).

The introduction of IRAs in the U.S. has provided one natural experiment to test the effect of savings incentives. The success of IRAs has been undeniable; by June 30, 1988, more than 300 billion dollars had been invested in IRAs. In itself, this is not a test of savings incentives, since the sudden increase in IRAs could represent a shift out of other, more heavily taxed, savings instruments. That is, IRAs could have been reshuffled saving from existing (taxable) accounts, rather than new saving from foregone consumption. Feenberg and Skinner (1989), and Venti and Wise (1987) suggest that the data are consistent with the "new" saving view of IRAs; that is, IRAs did represent new saving.<sup>7</sup>

Other researchers have attempted to evaluate the impact of taxation on savings in computable general equilibrium models using parameter values estimated in econometric studies (Summers, 1981; Fullerton, Shoven, and Whalley; 1983; Auerbach, Kotlikoff and Skinner, 1983; Ballard, Fullerton, Shoven, and Whalley, 1985) In

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<sup>7</sup> While the results in Feenberg and Skinner are consistent with the new saving view, they are also consistent with a more subtle reshuffling view of IRAs. At this stage it is difficult to conclude that IRA saving is entirely new saving.

these models, individuals hold a varying degree of foresight, and make current consumption and savings choices based not simply on current prices, but on future prices as well. They find uniformly large efficiency gains from switching to a general income tax to a consumption based tax. One explanation for these results is the extent to which future prices affect current consumption for the life cycle consumers. The reason is that over the extended horizon relevant for consumption, a 30 or 40 percent tax on interest can translate into a large distortion against future consumption. For example, if the gross interest rate were 8 percent and the tax were 40 percent, then the net return would be 4.8 percent. The cost of consuming one dollar of consumption 30 years in the future, in terms of current consumption, is 10 cents at the 8 percent interest rate, and 24 cents at the 4.8 percent interest rate. That is, the 40 percent statutory real tax rate translates into a 140  $\left(\frac{24-10}{10}\right)$  percent tax on future consumption. Another explanation for the large saving elasticities focuses on the individual's endowment of future earnings (Summers, 1981). A decline in the interest rate implies that the present value of future earnings will rise, which will tend to increase current consumption and hence reduce saving further. Given the combination of these two effects, it is not surprising that cuts in capital income taxation yield an improvement in utility, especially in models with infinitely lived individuals (Chamley, 1981).

It should be emphasized that the large savings elasticities which are implied by the life cycle model are rarely found in



empirical studies. This could be caused by inappropriate measures of savings, or by aggregation bias (in time series studies). My own opinion is that the simulation studies neglect issues of uncertainty. If, for example, there is uncertainty about future interest rates and wages (Skinner, 1988), or about what future taxes will be (Skinner, 1989), fluctuations in current net-of-tax interest rates are unlikely to signal a large change in future interest rates. This year's jump in the tax rate provides only a small amount of "news", relative to "noise" about the net interest rate 10 years hence. The role of uncertainty is likely to be even more important in developing countries, where regime shifts and fluctuating commodity prices are the norm.

Econometric studies of savings in developing countries are difficult, owing to problems of measurement. First, gross domestic saving is measured as a residual by subtracting the current account deficit from gross capital formation. Because there are usually no independent measures of national income, it is often difficult to check the accuracy of the savings estimates (Mikesell and Zinser, 1973). In addition, there is no single net return to saving or user cost of capital; different investment projects receive different tax treatment, while some savings accounts may enjoy preferential treatment over others. In light of these measurement problems, it is perhaps not surprising that evidence from developing countries about savings and taxation is mixed.

A more general model of savings and investment allows for the two to differ by including an international sector. In such a

model, incentives for investment will affect the country capital stock differently than incentives for savings (for example, Mutti and Grubert, 1985; Frankel and Razin, 1988). The reason is that investment incentives will encourage foreign investment in the home country, independent of what home country savings happens to be. Alternatively, a pure saving incentive (i.e., exempting capital gains from taxation) will encourage domestic saving, but the saving may be invested in other countries if the rates of return in those countries exceed investment opportunities in the home country.<sup>8</sup> Despite the theoretical unshackling of incentives to encourage saving, and incentives to encourage investment, there is a surprising degree of correlation between the two measures across countries (Feldstein and Horioka, 1980).

The discussion below will focus on investment incentives, since developing countries are often concerned with attracting foreign investment from developed countries. In addition, evidence is presented on the impact of the tax code on U.S. investment abroad, and on direct foreign investment in the U.S.

The fundamental problem with assessing the importance of investment incentives on actual investment is whether such provisions encourage additional investment. Firms which had already planned to invest in the country would take advantage of the

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<sup>8</sup> This assumes that taxes are based on residence; hence a US saving incentive will benefit a US citizen whether his savings are invested in the US or in Mexico. Alternatively, a US citizen could invest money in a Swiss bank to avoid high residence-based taxes.

incentive, possibly without any change in economic behavior. If this were the case, the "incentives" would simply represent a transfer of revenue from the government to the business sector.

Tables 1 and 2 present a summary of fiscal incentives offered in 28 developing countries; the data are from Shah and Toye (1980).<sup>9</sup> The primary mechanism for providing investment incentives is the tax holiday, in which the company is exempt from company taxes for a fixed number of years which, in this sample, ranges from 2 to 10. The second most popular incentive is some form of high depreciation allowance, investment credit, or development rebate. The third commonly used scheme is the exemption of imported capital goods from import tariffs.

There are a number of methods for testing whether these incentives are effective.<sup>10</sup> Some studies have examined the investment to GNP ratio before and after the tax changes (see references in Shah and Toye (ST)), although it is difficult to attribute changes in this ratio only to the tax changes. Essentially (if there is no trend), there is a 50 percent probability that the investment to GNP ratio will go up after the tax change.

Alternatively, the businessmen can be interviewed to assess

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<sup>9</sup>For an overview of investment incentives in developing countries, also see Usher (1977).

<sup>10</sup>This section draws heavily on Shah and Toye (1980).

**TABLE 1**  
**SUMMARY OF FISCAL INCENTIVE SCHEDULES IN 28 DEVELOPING COUNTRIES**  
**TYPE (A1) SCHEDULES ONLY**

Country	Source*	Tax Holiday (years)	Loss Carry-over (years)	Dividends	Annual Profit Limit	Other Conditions	Interest Deductible from Profits
1. Afghanistan	62(b)	4	—	Exempt	—	—	Yes
2. Bangladesh	53	5	—	Ex.	—	—	—
3. Barbados	21(a)	7/9	5/7	Ex. until year 9/11	—	—	Yes
4. Ecuador	37, 61, 62(d)	5	6	Ex.	—	—	Foreign loans only
5. Fiji	21(f), 58, 66	5	6	Ex.	15% K	—	—
6. Guyana	14, 15, 32	5	—	Ex.	—	—	—
7. Ghana	37	4/10	—	Ex.	—	—	—
8. India	18, 21(d)	5	3	Ex.	7% K	—	Long term foreign loans
9. Indonesia	55	2/3	indefinite	Ex.	—	see notes	—
10. Ivory Coast	37	5	—	Ex.	—	—	—
11. Jamaica	21(a)	5	6	Ex.	—	—	Yes
12. Malaysia	21(e), 34 41, 62(f)	2/3	—	Ex.	—	see notes	—
13. Mauritius	21(d), 58	5/8	indefinite	Ex.	—	see notes	—
14. Niger	37	10	—	—	—	—	—
15. Nigeria	44, 49, 50, 62(d)	2/5	4	Ex.	—	see notes	—
16. Paraguay	62(e)	5	—	—	30% to 30% K	—	—
17. Pakistan	3, 6, 19, 20 21(d), 29, 53	4 (to '65) 2 (to '71)	—	Ex.	5% to 10% K	—	Foreign loans only
18. Peru	65	3	—	Ex.	—	—	—
19. Senegal	37	8	—	—	—	—	—
20. Sri Lanka	4, 5, 53	5	—	Ex.	10% K	see notes	—
21. Sierra Leone	37, 58	5	indefinite	Not Ex.	—	—	—
22. Singapore	21(e), 28	5/10	—	Ex.	—	see notes	Yes
23. Sudan	21(b), 60	3/10	5	Ex.	10% K	see notes	—
24. Surinam	11	5/10	—	Ex.	—	see notes	—
25. Tanzania	21(b)	—	—	—	—	—	—
26. Trinidad and Tobago	21(a)	5/10	5	Ex.	—	see notes	Yes
27. Uruguay	68	10	—	—	—	—	—
28. Zambia	21(c)	—	—	—	—	—	—

\*The figures in this column refer to the numbered sources in the Reference list at the end.

- Notes**
9. *Indonesia*. If capital investment is \$2.5 million or less period of tax holiday is 2 years. If more than \$2.5 million, 3 years.
  12. *Malaysia*. If capital investment is M\$250,000, tax holiday period is 2 years; if up to M\$500,000, 3 years; if up to M\$1 million, 4 years; if over M\$1 million, 5 years.
  13. *Mauritius*. If 100 employed, 2 extra years tax holiday; if 200 employed 3 extra years; if up to 350 employed, 4 extra years; if over 350 employed, 4 extra years.
  15. *Nigeria*. If capital investment less than N. 10,000, no holiday.
  21. *Sri Lanka*. 20 per cent additional tax relief, if over 50 employed.
  22. *Singapore*. If capital expenditure exceeds \$10 million, tax holiday extended to 10 years.
  23. *Sudan*. If capital expenditure is up to £50,000, period of tax holiday is 3 years; if capital expenditure is up to £150,000, period is 5 years. Holiday is extendable by a further 5 years.
  24. *Surinam*. Period of tax holiday is up to 10 years, depending on the size of the capital investment.
  26. *Trinidad and Tobago*. Period of tax holiday on a sliding scale between 5 and 9 years. 10 ; -are tax holiday for capital intensive and enclave enterprises.

Source: Shah and Teye (1980).

**TABLE 2.**  
**SUMMARY OF FISCAL INCENTIVE SCHEMES IN 28 DEVELOPING COUNTRIES - TYPE (A2), (B1) AND (B2) SCHEMES**

Country	Source*	(A2) First Year Allowance	Annual Allowance	I.A., I.T.C. or D.R.	Extra Shift Allowance	(B1) Import Duty Exemption	(B2) Investment Grant
Afghanistan	62(b)	—	—	—	—	—	—
Bangladesh	53	10/30%	—	—	—	P + M Ex.	—
Barbados	21(a)	20% on P + M	—	I.A. 40% on P + M	—	—	—
Ecuador	37, 61, 62(d)	—	20% (5 yrs.)	—	—	P + M Ex.	—
Fiji	21(f), 58, 66	20% on P + M	At taxpayer's discretion	I.A. 55%	—	—	Up to 50% K (hotels only)
Guyana	14, 15, 32	40% on P + M 10% on B	—	—	—	P + M Ex. (10 yrs.)	—
Ghana	37	—	—	—	—	—	—
India	18, 21(d) 31, 53, 57	25% of K†	—	D.R. 15/25 40%††	D.S. = 50% D T.S. = 100% D	—	—
Indonesia	55	—	—	—	—	P + M + R Ex.	—
Ivory Coast	37	—	—	—	—	—	—
Jamaica	21(a)	20% of K	—	I.A. 20%	D.S. = +20% of I.A.	—	—
Malaysia	21(e), 34 41, 62(f)	80% of K	20% (1 yr.)	I.T.C. 25%	—	—	—
Mauritius	21(d), 58	—	—	—	—	—	—
Niger	37	—	—	—	—	—	—
Nigeria	44, 49, 50 62(d)	—	—	—	—	P + M + R Ex.	—
Paraguay	62(c)	—	—	—	—	—	—
Pakistan	3, 6, 19, 20 21(d), 29, 53	10/30% on P + M	15% p.a.	I.T.C. 10%	D.S. = 50% D T.S. = +100% D	P + M + R Ex.	—
Peru	65	—	—	—	—	P + M + parts Ex.	—
Senegal	37	—	—	—	—	—	—
Sri Lanka	4, 5, 53, 62(a)	33 1/3/80%	—	I.T.C. 10% D.R. 20/40%	—	P + M Ex.	—
Sierra Leone	37, 58	—	—	—	—	—	—
Singapore	21(c), 28	20/100% (discretionary)	33 1/3%	—	—	—	—
Sudan	21(b), 60	—	—	—	D.S. = +3 x D	P + M + parts Ex.	—
Surinam	11	—	(optional)	—	—	P + M + R Ex. (First 3 yrs.)	—
Tanzania	21(b)	—	12 1/2% p.a.	I.A. 20%	—	—	—
Trinidad and Tobago	21(a)	0/40% on P + M after holiday	—	—	—	—	—
Uruguay	68	—	—	—	—	—	—
Zambia	21(c)	—	—	I.A. 20%	—	—	—

\*The figures in this column refer to the numbered sources in the Reference list at the end.

Key to table: I.A. is investment allowance, I.T.C. is investment tax credit and D.R. is development rebate.  
P is plant, M is machinery, B is buildings, R is raw materials, K is capital expenditure, D is depreciation,  
D.S. is double shift and T.S. is triple shift.  
† with effect from June 1974. †† up to and including May, 1974.

Source: Shah and Toye (1980).

whether the tax incentives were important in their decisions. In a study of Mexico (Stanford and Christensen, 1959; quoted in ST), 14 of 24 firms surveyed said they would have invested the same amount even in the absence of the tax incentives. Nine firms reported that the "probably" would have invested the same amount, while only one firm attributed an important role for the tax incentives. Of 40 Pakistani firms surveyed, 8 reported that the tax incentives were important factors in their decision (Azhar and Sharif, 1974; ST). The equivalent figures for Jamaica was two firms out of 55 surveyed (Chen-Young, 1967; ST). As Shah and Teye (1980) note, bias in questionnaires can go in two directions. The first is that businessmen claim that the tax effects are no important, in order to extract more concessions from the government. The second, more likely, bias is that businesses may overstate the impact of the incentives to convince the government to retain such "effective" tax instruments.

A third method is to calculate what profits would have been had there been no investment incentive, and compare that measure with a "critical minimum rate of profit which firms require." If the profit rate without incentives is below that rate, but the profit rate with incentives is above that rate, the incentive package is judged to have been a success. Tax incentives in Pakistan (Azhar and Sharif, 1974; Kemal, 1975) and in Colombia (Billsborrow and Porter, 1972) were estimated to have increased investment by 20 percent, 30 percent, and 10 percent, respectively (the two Pakistan studies used different assumptions).

Despite the wide use of investment incentives, the evidence about their effectiveness is mixed. What, then, accounts for their widespread use in the face of such little evidence of their effectiveness? Shah and Tøye consider a number of possible explanations. The first is that tax evasion and avoidance will allow firms to avoid paying taxes, so countries simply make de jure what is already de facto. However, it seems hard to believe that large and visible corporate representatives of wealthy capitalist countries can evade tax collection as easily as the small merchant in the marketplace.

Another explanation suggests that competition among countries for foreign investment will keep taxes to a minimum. While this explanation may appear reasonable for smaller countries, it is less appealing for countries such as Nigeria or Indonesia that have large domestic economies.

Shah and Tøye suggest finally that the nature of the incentives, and the fact that they coexist with quantity restrictions and licensing regulation, suggests that countries are not necessarily responding to outside demand pressures, but instead to the pressures of wealthy investors inside the country, who stand to benefit from the manipulation of quantity restrictions and other government constraints, while at the same time freeing companies from paying taxes.

In summary, the wide use of investment incentives appear to have some effect on business investment, but at a high cost of foregone revenue to companies who would have invested without

incentives. The potential for transfer pricing and other financial contortions to shift company profits into branches that enjoy tax concessions is likely to reduce revenue as well. A better explanation for why investment incentives are so popular may come from industrialist political pressure groups who enjoy influence with legislators and governments.

Econometric evidence from the United States seems to suggest a pronounced role for tax policy in affecting the location of investment. Boskin and Gale (1986), updating and extending work by Hartman (1984), suggest that the own-price elasticity of foreign investment in the U.S. is approximately 1.0, while the own-price elasticity of U.S. investment abroad is in excess of 1.0. There appears to be some stability in these estimates, despite the substantial fluctuation in direct foreign investment in the United States during the early 1980s.

To this point, the negative impact of taxation on investment has been emphasized. However, comparative data across countries provides a dissenting view. Figure 4 shows average investment/GDP ratios over the period 1970-80 compared to average tax effort (tax revenue/GDP) over the same period.<sup>11</sup> There is a strong positive

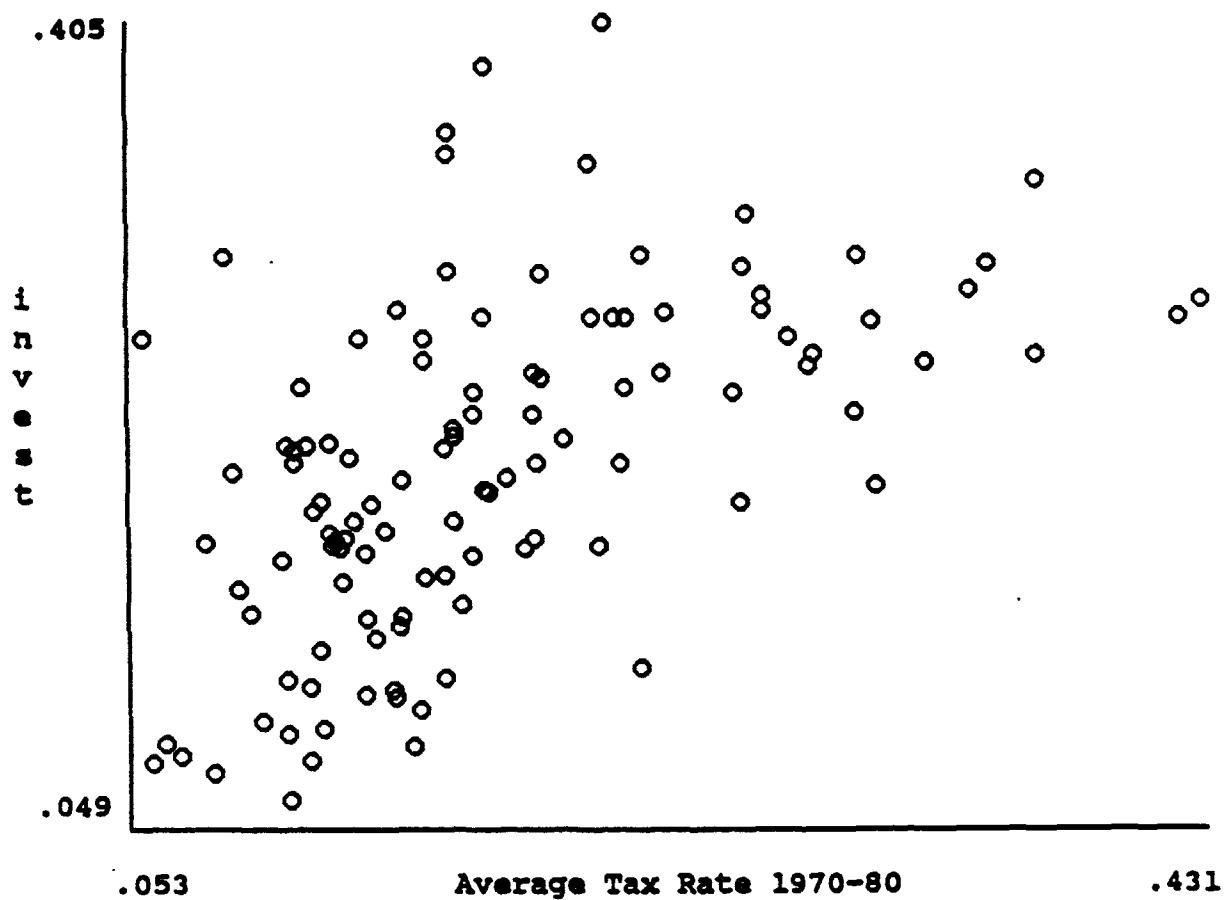
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<sup>11</sup>The investment and GDP data come from Summers and Heston (1984), and are in real terms. The Summers and Heston series is calculated to provide internationally comparable measures of national accounts. See Lindauer (1987) for a comparison of these data with standard government statistics.

Note that only average tax rates are used here. While marginal tax rates would be more useful, they are not available for developing countries.



Figure 4: Investment and Tax Rates for 111 Countries: 1970-80



Note: Investment is defined to be the ratio of gross investment to GDP, averaged over 1970-80. Real data used from Summers and Heston (1984).

correlation between investment ratios and the overall tax effort (Koester and Kormendi, 1988).

One interpretation of the correlation between taxation and gross investment would be that a large fraction of the investment is public, so that higher tax rates translate into higher investment rates. This finding would be in accordance with the traditional view that the government has a higher marginal propensity to save, so that higher taxes lead to higher overall savings rates. The positive correlation between private investment/GDP ratios and average tax rates in African countries, however, is less consistent with this view. The positive correlation could also be consistent with a "crowding out" argument; that higher tax effort will be associated with lower deficits, so there will be less national saving absorbed by public debt creation. Whether crowding out is an important factor in incomplete financial markets of LDCs is not clear at this point. In summary, the positive correlation between the ratio of total investment to GDP, and average tax effort is something of a paradox.

#### Taxation of Wealth and Property

The taxation of property has been one of the earliest sources of government revenue. Governments have relied either on movable property, such as livestock, or on immovable property, such as land and structures. While these taxes may appear to be relatively non-distortionary, they can change property owners' behavior in such a way to reduce economic efficiency. Consider first the immovable property tax as administered in 17th century England. Rather than a

lump sum tax on dwellings, the tax was based on the size of the house, as proxied by the number of hearths. The tax led to some hearths being walled up; Sir Peter Courtney in Cornwall walled up 6 of 21 hearths during 1662 (Stoate, 1981). In a comparison of hearth tax assessments between 1662 and 1664, fully 3.2 percent of all hearths in 1662 were reported walled up in 1664 (Stoate, 1981; pages xii-xiii).

There was apparently some confusion over whether the walled up fireplaces were restored after the tax collector left, or whether they were permanently walled up. A permanent reduction in the number of hearths corresponds to an efficiency loss from the tax. Residents gain nothing from the hearths, nor does the government collect any revenue. Yet the original owner spent resources on building the now useless hearth. Alternatively, the hearths could be walled up temporarily, to coincide with the visit of the tax collector. While the hearths would be used (between tax collections), a substantial amount of wasted effort would go into bricking, and then bashing, the barrier. Another example of permanent efficiency cost were the houses built with fewer windows so as to avoid the window tax. The efficiency loss is the necessity of residents to live in dark houses, with no corresponding gain to the government.

There is also historical evidence that the taxation of movable property leads to a waste of resources. For example, Adam Smith finds that

In the countries where the personal taille takes place, the farmer is commonly assessed in proportion to the stock which he appears to employ in cultivation. He is, upon this account, frequently afraid to have a good team of horses or oxen, but endeavours to cultivate with the meanest and most wretched instruments of husbandry that he can....The public, the farmer, the landlord, all suffer more or less by this degraded cultivation. [Smith, 1976: 383-384]

Since the 17th and 18th century, there has been a general decline in the use of wealth taxes. Especially in the case of land taxation, they have proved to be highly unpopular, and with the monetization of economies, governments have switched gratefully to sales, customs, and income taxation. There are only two real exceptions to the general decline in wealth taxation; the first is the urban property tax, and the second is the property transfer tax. Urban property taxation, while struggling with assessment lags and evasion, has maintained a strong role in supporting local finances.

The taxation of property transfer occurs only when deeds or titles are transferred and recorded by government agencies. It is economically less efficient than the straight taxation of property, since it restricts the mobility of property by "locking in" ownership. Transfer taxation is often justified as taxing wealthy landowners who are buying additional land, but the tax may just as well cause a fall in the net sale price of the potentially distressed landowner who is forced to sell by economic necessity. The transfer tax ranges in most countries from 3 percent to 15 percent; in one country (Bangladesh), it raises more in revenue than a tax assessed on all land, despite the fact that land transfers are quite infrequent. One reason why the property transfer tax may

enjoy increasing popularity is its potential for maintaining revenue collection in the face of inflation. While property tax assessments typically lag far behind market value in countries with high inflation rates, declared property transfer prices will keep up with, or even surpass, inflation rates. Furthermore, the administrative costs of the tax are very low, since the tax must be paid before the deed is transferred to the new owner.

#### Tax Administration, Compliance Costs, and Smuggling

Historical examples of tax avoidance and administrative costs are numerous. In 17th century France, the costs of administration were far greater than the net revenue to the government; of the 19 million livres expected from the taille (a lump sum or poll tax), only 6 million were delivered to the central treasury. The remainder was consumed by administrators and local tax collectors (Webber and Wildavsky, 1986, p. 278). By the same token, the zamindars, or tax "farmers", in India had by 1900 increased revenue from farmers to Rp. 165 million, but turned over to the British government only Rp. 39 million (Hossain, Rahman, and Akash, 1985). More recently, the Bangladesh Land Development Tax has reported administrative costs in excess of 66 percent of total tax revenue. One reason why the administrative costs of these taxes have been so high is that a large fraction of the population must be induced to pay very small payments, leading to a great deal of administrative effort for each rupee or taka.

Trade taxation is usually the tax instrument exhibiting the lowest collection cost. Adam Smith reported average costs of

slightly over 10 percent of revenue, but since that time collection costs have fallen to an average of 1 to 3 percent, even in less developed countries.

Aside from the direct administrative costs, taxpayers often reduce tax payments by evading or misrepresenting the value on which their tax is assessed. During the 13th century, movable property taxes in England were occasionally assessed for to pay ransoms for captured kings, provide a dowry for princesses, or to finance holy crusades. During this time, English taxpayers were not slow to discover the benefits of under assessing property:

We have lately heard that the four jurors ... are violating their oaths by false valuations, namely, they generally value an ox at five shillings, when it is worth ten shillings or even more; a pig which is worth two are three shillings, they value at 6d.; ... we shall not receive half of the thirtieth granted to us so generously by the magnates and others of our realm. [Close rolls, 1234-1237, p. 569; from Mitchell (1970)]

What are the costs involved here? There are clearly administrative problems, but if every juror persists in undervaluing the property, then the target revenue could just as well be raised by doubling the tax rate. Yet assessors could compensate for the doubling by undervaluing to an even greater extent. However, variations in assessment practices will lead to inequities in tax collection as well.

An additional cost of tax administration is tax compliance. Even if taxpayers are perfectly honest, they must still spend time and money on keeping records for tax collection, and on preparing

their tax return. In some countries, this compliance cost is reflected in administrative costs, since the tax officials will also fill out tax returns. However, in most countries these are costs borne entirely by the taxpayers. Slemrod and Sorum (1984), for example, have estimated the aggregate cost of tax compliance was between \$17 and \$27 billion dollars in the United States during 1982. This translates to more than 5 percent of total taxes collected.

A further cost of taxation is the uncertainty caused by a change in the tax regime. For example, following the 1981 Economic Recovery Act in the U.S., companies were allowed to trade tax credits. This "safe harbor leasing" provision was controversial, and it was uncertain whether it would be rescinded. Fear of the tax change lead to sales of the tax benefits at less than half their actual value, because, as one corporation chairman put it, he feared the "risk of losing the tax benefits through a change in the tax law or other contingencies." (Skinner, 1989).

More generally, uncertainty about future tax rates often leads to a welfare loss. If, for example, the government sets new taxes that provide investment incentives, countries may be unwilling to invest because they are not convinced that future tax rates will not increase. In this situation, the government treasury loses revenue without associated gains in investment. In summary, repeated tax reform may be viewed not as a successive approximation to the optimal tax system, but as a signal that new tax changes are forecast for the future.

### On the Marginal Cost of Taxation

The previous subsections have attempted to provide heuristic illustrations of the social cost of taxation. For the purposes of tax reform, however, one often focuses on marginal tax changes. As was illustrated in Section II, the marginal cost of increasing revenue from an existing tax is generally higher than the overall (or average) tax burden. It is therefore useful to briefly review the evidence on the marginal cost of raising (or benefits of cutting) taxes, since these measures are important for making policy judgments.

The literature on the excess burden of taxation has, for the most part, used models most appropriate for developed countries. The focus of Stuart (1984), Ballard, Shoven, and Whalley (1985b), Browning (1976, 1987), and others has been to calculate the marginal excess burden of taxation in the United States in competitive models with generally free factor flows and prices which adjust to the different tax rates.

Among the first studies of marginal excess burden was Browning (1976). He estimated that the excess burden was between 9 and 16 cents per dollar of revenue collected. Later researchers found measures larger in magnitude; using a two-sector general equilibrium model of the United States, Stuart (1984) found that the marginal excess burden of a labor income tax was between 7 and 50 cents, depending in part on how the revenue was used. Similarly, a computable dynamic general equilibrium study by Ballard, Shoven, and Whalley (1985) suggested that the excess burden was between 25 and



50 cents per dollar. One might think that the difference between Browning and later studies is due to the later studies allowing for general equilibrium effects. However, Browning (1987) argues that most of the difference in the marginal excess burden measures is caused by different assumptions about the correct empirical parameters of the model. For example, in a simple partial equilibrium model, he showed that the marginal excess burden (in the case where earnings are allowed to decline) could range from 11 cents per dollar to 3 dollars, depending on the labor supply elasticity (either .2 or .4); the progressivity of the tax (the ratio of marginal to average taxes being either .8 or 2) and the tax rate (.38 or .48). Browning concluded that most of the variation in marginal excess burden measures occurred because of differences in empirical parameters.

As Stuart (1984) has shown, another important factor that affects the marginal excess burden is how the revenue is used. If, for example, the income is redistributed, then compensated elasticities are used to calculate excess burden. These are generally higher than uncompensated elasticities, which are the appropriate measure for calculating excess burden when the tax is used for government services which do not substitute for private services (see Ballard, 1987).

Ahmed and Stern (1984) focused on the marginal excess burden of different commodity taxes in developing countries. Based on cross-price elasticity estimates of commodities in India, they were able to measure the social marginal excess burden of raising each

specific commodity tax rate. By including information on expenditure shares across income classes, they were also able to evaluate the distributional impact of the tax changes. One use of their estimates would be to first specify some social welfare function, and then minimize the excess burden of the tax structure by equating the marginal cost of each commodity tax. They focused on a different issue -- what social welfare function is maximized by the observed commodity tax structure set by the government? That is, if the social welfare function implicitly maximized by the government is regressive, or not well defined, it suggests the need for changes in the tax structure.

The previous section has attempted to document the incentive effects of taxation. Factors such as efficiency costs and compliance costs are difficult to measure directly, although one might expect that ultimately, they will be reflected in national income. It is to this topic that we turn next.

#### IV. Output Growth and Taxation

There are two methods for estimating the efficiency costs of taxation. The first is to develop a theoretical model, and calculate efficiency costs by plugging in empirical parameters from a variety of studies. The second, which is followed below, estimates what is essentially a reduced form equation of taxation, fiscal policy, and GDP. The advantage of this method is that it is a direct measure of efficiency costs which reflects parameters (such

as the dynamic effects of tax policy ) which are generally difficult to model properly in theoretical models. In addition, the estimates derived below are readily understandable to policy makers -- do taxes affect the level, or the growth rate, in national output? There are shortcomings to this direct estimation of taxation and output; the potential for mismeasured data, unobservable factors affecting both tax rates and output, and endogeneity. These shortcomings are discussed in more detail below.

While this survey is concerned primarily with the excess burden of taxation, the models discussed below can be used to address a broader issue, which is whether the benefits of government spending justify the efficiency costs of the taxes necessary to finance it.<sup>12</sup> That is, taxes may be distortionary, but the relevant policy question is whether the marginal benefits of tax-financed government expenditures exceed the marginal distortionary costs of collecting the revenue.

The review of the evidence that follows will both summarize existing literature, and provide new evidence from a complete sample of 111 countries using variables on output, investment, and

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<sup>12</sup>There are sources of government revenues other than taxes, but I would argue that taxation is the only feasible long-term method of financing. Debt can be used in the short run, but taxes must be raised in the future to pay back the debt. While the country has the option to default (or inflate away the value of the debt), it is unlikely to find new sources of borrowed money after doing so.

government consumption. The data are derived from Summers and Heston (1984), the Government Financial Statistics (IMF, 1986) and other sources, and are discussed in more detail in Engen and Skinner (1988). The Summers and Heston data have been converted to internationally comparable price levels, and have been widely used in cross-country studies. I begin first with ad-hoc linear models of taxation and national output, and of government spending and national output. Second, Ram's model of government spending, and Engen and Skinner's model which includes both government spending and taxation, is presented. Finally, potential shortcomings of these cross-country estimation models are discussed.

The study by Marsden (1983) was among the first to test the hypothesis that taxes should affect output growth rates.<sup>13</sup> He matched 10 high tax countries, such as Zambia, Britain, Chile, and Zaire, with 10 low tax countries such as Singapore, Korea, Uruguay, and Japan. The country pairs were chosen on the basis of "similar per capita incomes but contrasting tax levels," and the difference in growth rates for the two sets of countries were then calculated. Countries with high tax rates (defined to be the ratio of tax revenue to GDP) experienced a lower average growth rate than those with low tax rates. Marsden's results imply that "an increase of

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<sup>13</sup>The earlier literature on taxation and output focused on the opposite question -- what is the "appropriate" tax effort for a country in a particular stage of development. The direction of causation is modeled in reverse; GDP, the independent exogenous variable, affects the choice of tax effort, the dependent variable (Newlyn, 1985; Tanzi, 1987).

one percentage point in the tax/GDP ratio decreases the rate of economic growth by 0.36 percent (sic) points." Translating from growth rates to differences in per capita income, Marsden's coefficient implies that a 3 percent increase in the tax to GDP ratio will reduce the level of GDP 20 years in the future by 20 percentage points  $(1 - .036 \times 3)^{20}$ .

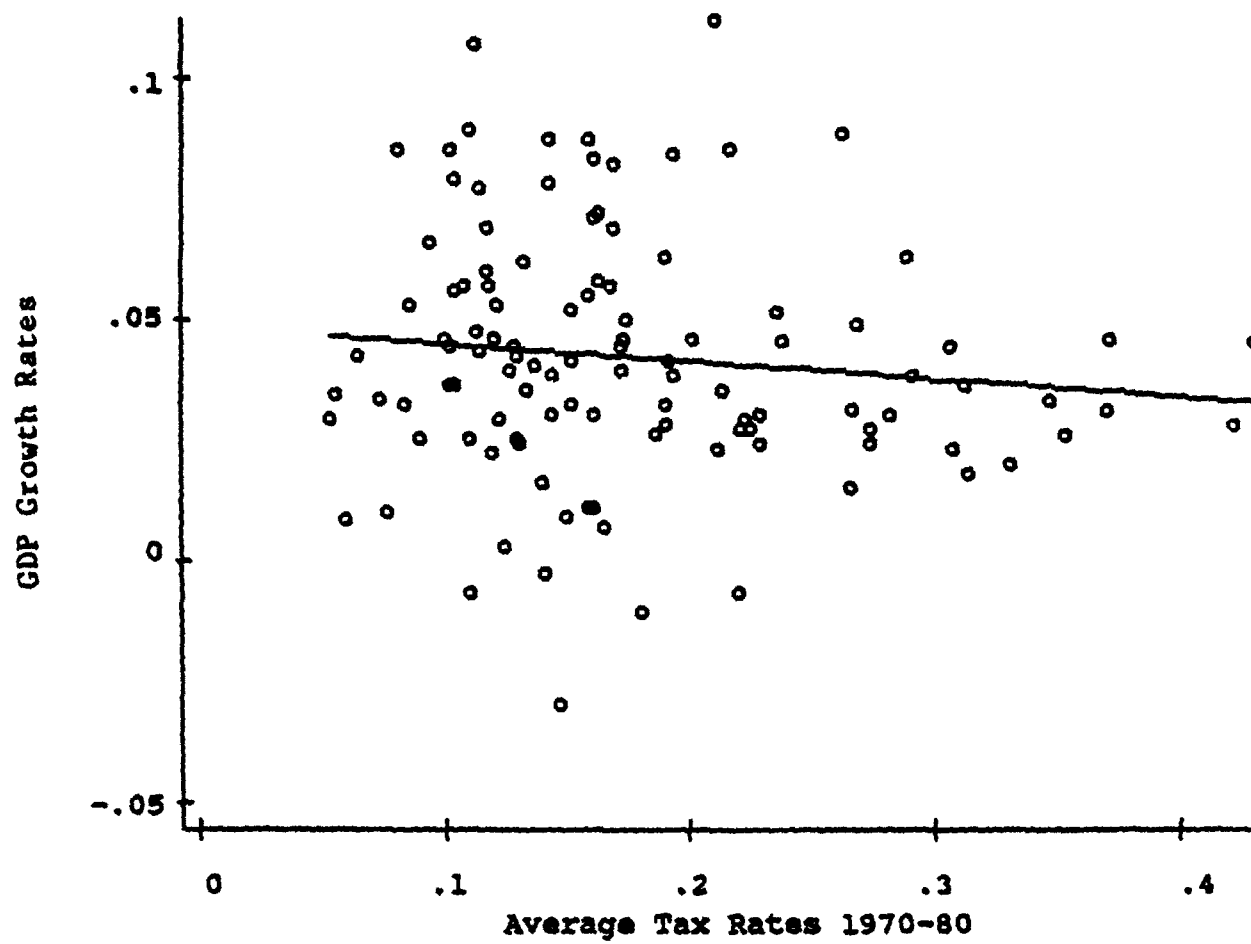
One shortcoming with this study is the lack of a theoretical framework, a problem that it shares with a number of other studies. For example, as is discussed below, standard neoclassical growth theory predicts that tax rates affect the level, but not the growth rate of GDP in steady-state equilibrium. Second, the choice of the 20 country sample is not random. A better test of the hypothesis that taxation affects output growth is to examine the entire sample of countries for which data are available. A scatter diagram is presented in Figure 5 which shows real GDP growth as measured by Summers and Heston for the period 1970-1980, compared to the average tax rate during that period.<sup>14</sup> There is no obvious simple correlation between tax rates and GDP growth rates; the slope of the regression line (shown in the graph) is  $-.036$  (so that a one percentage point increase in the tax effort is predicted to reduce output growth by  $.036$  percentage points) and is insignificant.

One potential shortcoming with Figure 5 is that all countries are weighted equally; if small countries are "outliers", they may

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<sup>14</sup>For some countries, tax rates (and output growth rates) were averaged over 8 or 9 years owing to the lack of data.

Figure 5: GDP Growth Rates and Average  
Tax Rates: 1970-80



mask the true correlation between output growth rates and taxation. To correct for this, Figure 6 presents the correlation between taxation and output growth weighted by the (normalized) country population. Again, no clear correlation arises. Finally, Marsden (1983) in his matching technique, attempts to correct for differences in per capita income. A regression which controls for per capita income levels is as follows:

$$\dot{Y} = 0.046 + 0.007 \times \text{Tax} - 0.316 \times Y$$

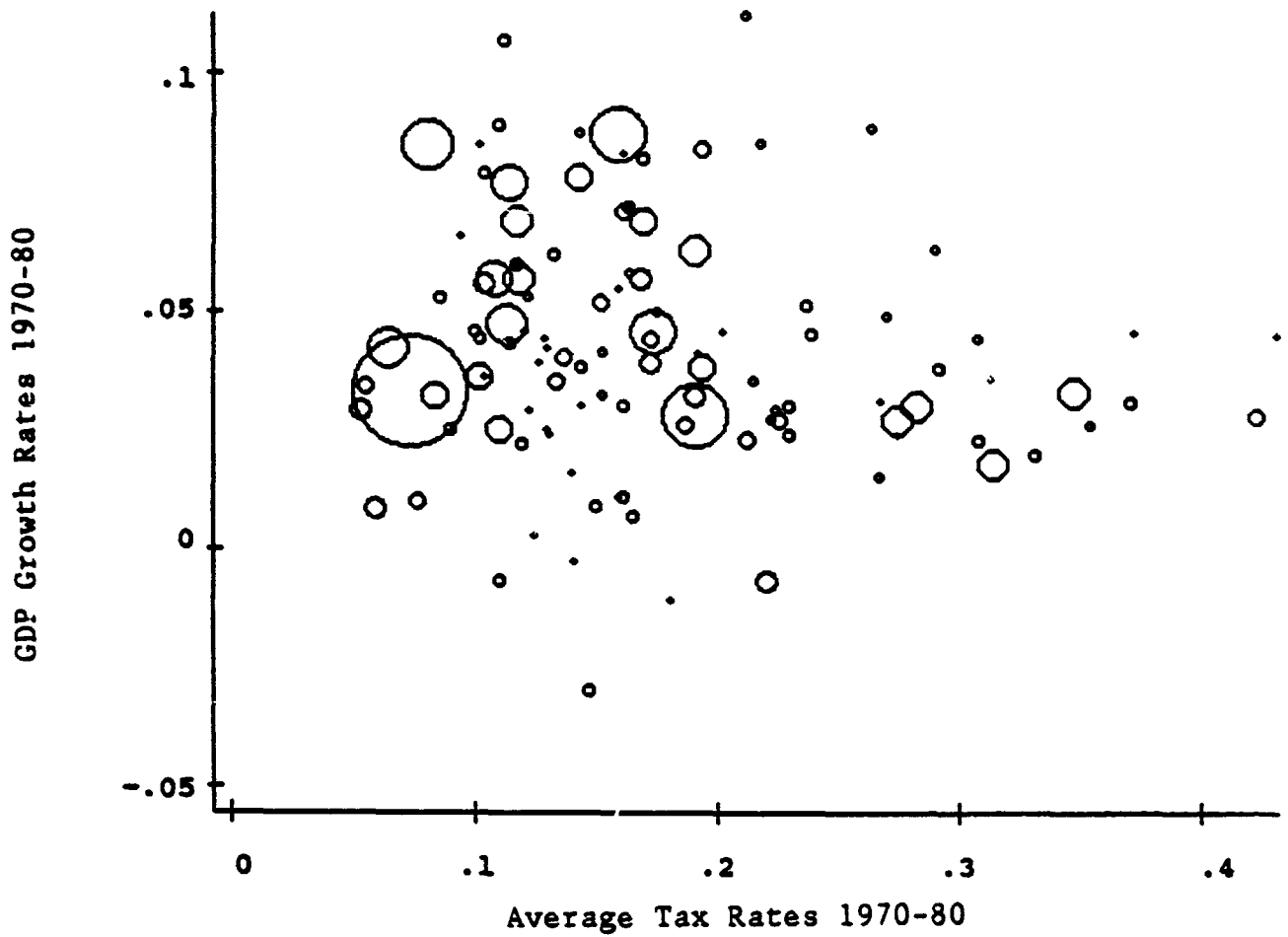
(7.87)      (0.18)              (1.61)

$R^2 = .004$   
N = 111

where  $\dot{Y}$  (in percentages) and  $Y$  (in thousands of US dollars) are the growth rate, and level, of GDP, respectively, and absolute values of t-statistics are in parentheses. Given that the coefficient on Tax (the tax effort) is insignificant, there does not seem to be a simple correlation between growth rates and taxation (also see Koester and Kormendi, 1988).

The impact of taxation on output growth rates is mixed conditional on a larger number of variables in cross-country regressions. For example, Martin and Fardmanesh, 1987 (their regression D, p. 18) find that taxation has little effect on growth rates, conditional on accumulated investment, population growth, and government spending. Koester and Kormendi (1988) similarly find little evidence that taxation affects growth rates. However, Landau (1986) estimates a negative conditional correlation, as does Engen and Skinner (1988) and Skinner (1987). To illustrate this finding, consider again the full sample of 111 countries during the period

Figure 6: GDP Growth Rates and Average  
Tax Rates, Weighted by Population: 1970-80





1970-80. A simple regression of output growth and taxation which conditions on  $I/Y$ , the accumulated change in gross investment over the 11 year period,  $\dot{L}$ , the percentage change in population, and  $G/Y$ , government spending as a fraction of (initial)  $Y$ , is estimated to be

$$\dot{Y} = 0.019 + 0.160 \times I/Y + 0.895 \times \dot{L} - 0.098 \times G/Y - 0.062 \times \text{Tax}$$

(1.53)    (4.64)            (3.10)            (2.10)            (1.67)

$R^2 = .240$

The coefficient on average tax rates is significant at the 10 percent level. It is interesting to note that when the model is specified somewhat differently -- substituting the change in  $G$  divided by  $Y$  for  $G/Y$ , as suggested by Ram (1986) -- the tax coefficient rises to  $-.082$ , with a significance level of 2.51.

Koester and Kormendi (1988) used country specific regressions to calculate marginal tax rates. They ran the regression

$$\text{Tax}_t = a_0 + a_1 \text{GDP}_t$$

for each country and interpreted  $a_1$  to be the marginal tax rate. This is an ingenious method for measuring marginal tax rates from a minimum source of data, but it will also pick up discretionary changes in the tax code. Strictly speaking, such changes would not measure marginal tax "wedges" since they reflect inframarginal revenue collected on an existing tax base.<sup>15</sup> However, the authors

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<sup>15</sup>If a country has two sectors, and tax rates in one sector are higher than in the other, then if the heavily taxed sector grows faster than the other, the "marginal" tax as measured by this regression method will be higher than the average tax, even when the sector-specific taxes are held constant.

found that the ranking of countries according to their estimated marginal tax measures correlated well with a ranking based on the statutory marginal tax rates.

As noted earlier, they found little impact of marginal rates on output growth, although in cross-sectional regressions on the level of output, they found that the average tax rate had a positive effect, and the marginal tax rate a negative effect on output, with strong significance for each coefficient. They interpreted the positive coefficient on average taxes to proxy for a demand effect (larger countries tax more), and the negative coefficient on marginal tax rates to be the traditional distortionary effect.

One of the difficulties in arriving at a conclusion about the impact of taxation on output is the absence of an *a priori* model appropriate for estimating the effect of taxes on output. One attempt to develop a theoretical model is described in Skinner (1988). While taxes have no effect on the steady state growth path in neoclassical models (since growth rates are determined by factors such as population growth and technological change), taxes will affect growth rates along a transition path. Consider a simplified model of the economy in which there are two sectors in the economy, one which is heavily taxed (e.g, manufacturing and some large corporations in developing countries) and one which is not (small-scale agriculture, the underground economy, etc.). Taxes will tend to induce new economic inputs, such as investment and labor supply, to flow into the low-tax -- and less productive --

sectors. The introduction of taxation therefore reduces the overall marginal productivity of labor and capital, and thereby lowers the country growth rate conditional on the observed growth in labor and capital (this abstracts from secondary effects of taxes on the supply of labor and capital). Regression results using a sample of African countries (Skinner, 1987) and a more complete sample of 111 countries (Engen and Skinner, 1988) found a significant negative effect of taxation on the marginal product of capital and labor.

There has been a substantial amount of empirical research using cross-country data to test the impact of government spending on output growth rates. Landau (1983; 1986) found a strong negative impact of government spending (and more specifically, government consumption excluding military and educational expenditures) on output growth rates (also see Martin and Fardmanesh, 1987). To test this proposition using the data on 111 countries mentioned above, consider a simple graph which compares the average ratio of government consumption on goods and services to GDP during 1970-80 with GDP growth rates during the same period (Figure 7). The regression line (shown on the graph) is estimated to be

$$\dot{Y} = 0.057 - 0.084(G/Y) \quad R^2 = .021$$

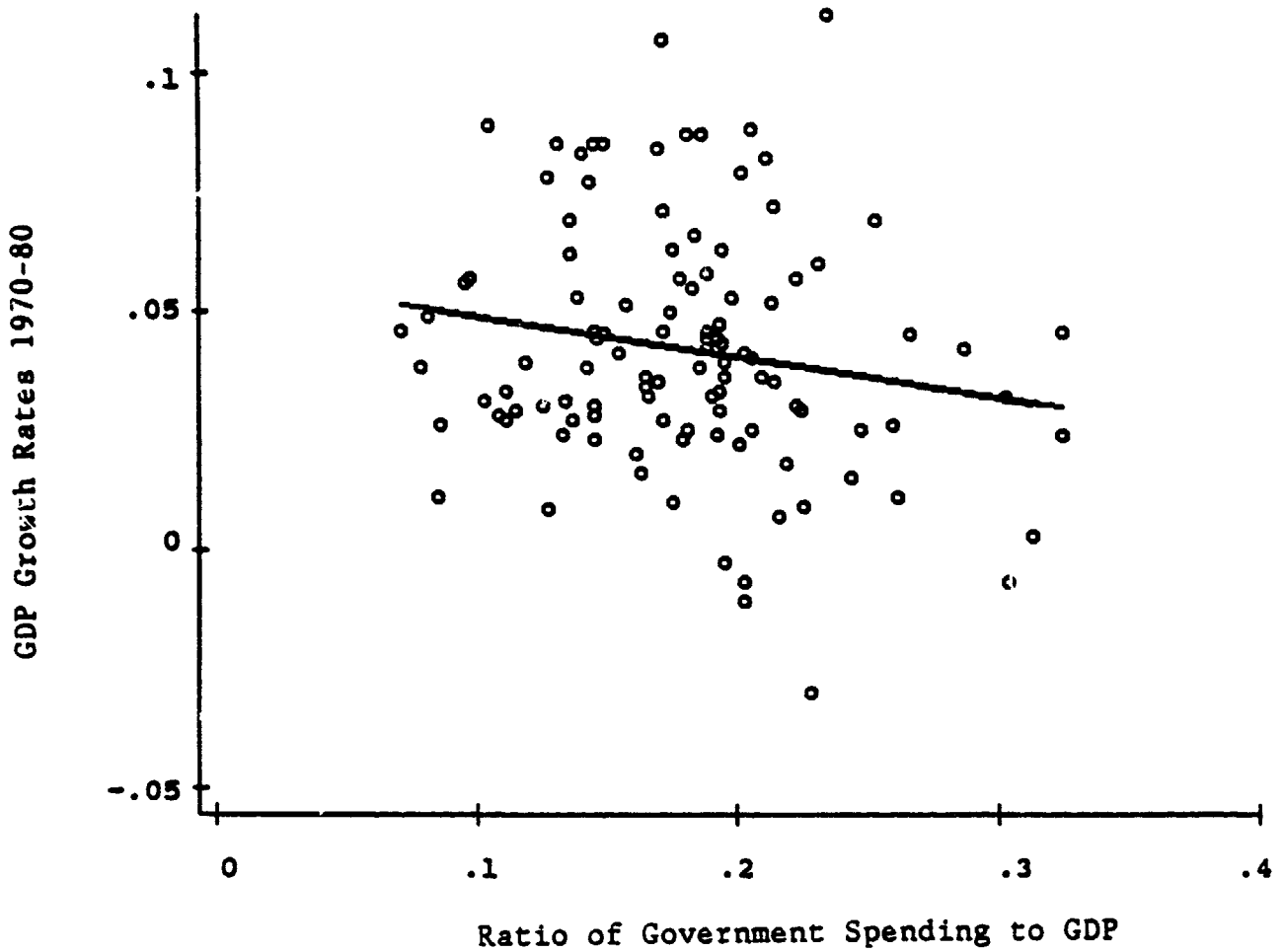
(6.68)    (1.84)

That is, the correlation is only moderate. However, when factors such as investment and population growth rates are also included, the results are somewhat stronger:

$$\dot{Y} = 0.012 + 0.132(I/Y) + 1.154(\dot{L}) - 0.118(G/Y) \quad R^2 = .227$$

(1.00)    (4.32)                    (4.69)                    (2.61)

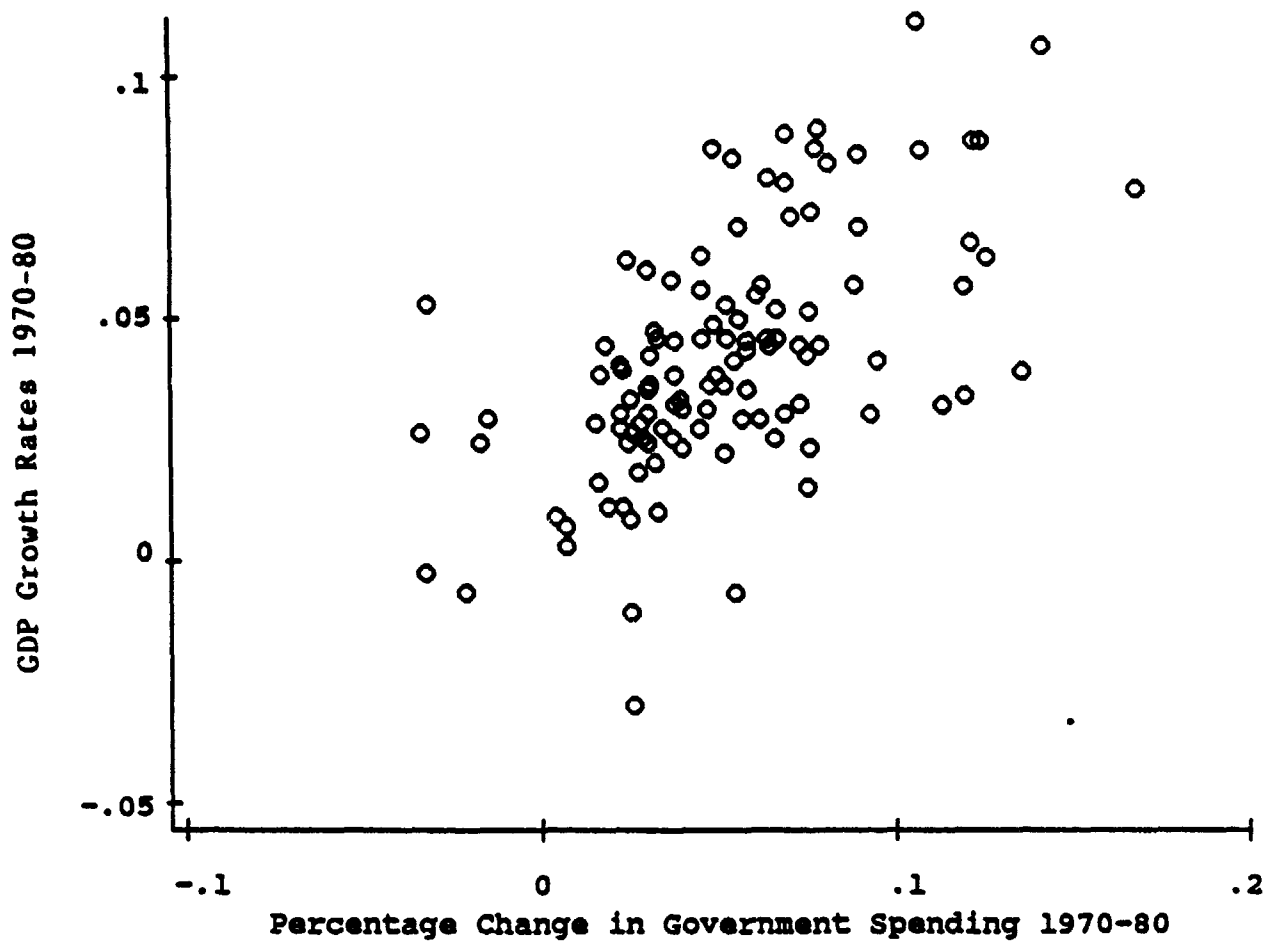
Figure 7: GDP Growth Rates and Government Spending: 1970-80



That is, the coefficient on  $G/Y$  is negative and strongly significant. Ram (1986) criticized the functional form used by Landau. Essentially, the point is that if  $Y$  is a function of  $G$ , then  $\dot{Y}$  -- the percentage change in  $Y$  -- should be a function of the change in  $G$ , and not the level of  $G$ . For this reason, Ram (1986a) developed a model of public and private output which tests the impact of the growth in government spending with the growth in output. He finds a strong positive effect of government spending, both using cross-sectional analysis and time-series regressions for each country. Ram's findings are strongly confirmed using my sample of 111 countries; the percentage growth rate in government spending is contrasted with output growth in Figure 8; the positive correlation coefficient is highly significant in a bivariate regression. Ram interprets this correlation to mean that government inputs of capital and labor are often more productive, and may confer positive externalities on the private sector.

While Ram was the first to provide a theoretical foundation for his econometric estimation, his analysis suffers from two shortcomings. First, his theoretical model expresses  $G$  as the contribution of government capital and labor to value added in GDP. However, the  $G$  that must be used by researchers is expenditures on goods and services. Hence measured  $G$  is a use, and not a source of income; the only measured contribution of government to GDP is through its payroll.

Figure 8: GDP Growth Rates and Percentage Growth in Government Spending 1970-80



Second, there is the potential for endogeneity. Countries which grow quickly may also be likely to expand their government services. A regression of the growth in government spending on output growth may simply reflect a high income elasticity of government spending. Ram (1986b) suggests that this endogeneity is not serious; a related paper (Ram, 1987) argues that there is little evidence from cross-country comparisons to support the view that government consumption is positively related to per capita income (also see Lindauer, 1987). Finally, Engen and Skinner (1988) attempt to control for this endogeneity in a simultaneous equations model of government spending and output growth.

What do these studies imply about the relative costs and benefits of tax-financed government spending? Martin and Fardmanesh (1987) found an insignificant but positive effect of taxes on output growth rates, but government spending has a negative and significant impact on GDP growth (Regression D, p.18). While the authors interpret this to mean that reducing deficits will spur output growth, the regression suggests that cutting government spending will have a greater impact on economic growth than raising taxes.

There are some general shortcomings of cross-sectional studies. First, it is unlikely that the coefficients estimated will be similar across countries; the marginal product (in elasticity form)

of a one percentage point increase in labor supply may be different for different countries.<sup>16</sup> Another problem is that other, unobservable factors, such as a well administered civil service, could encourage growth rates in output, lead to efficient collection of taxes, and provide government services at low cost. In this case, a regression would find a positive coefficient on taxes and a negative coefficient on government spending, even if there were no causal relationship among the three factors. Finally, the endogeneity problem (as discussed above) can lead to biased regression coefficients.

In summary, whether one thinks that government spending contributes to, or subtracts from, output growth depends on the model that one has in mind. GDP growth rates are positively correlated with the growth in G, but negatively correlated with the level of G. The impact of taxes on output growth rates is negative in some studies, but not significantly different from zero in others.

## V. Conclusion

Economists have stressed that the efficiency costs of taxation are not the obvious costs -- to taxpayers -- of handing over

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<sup>16</sup>When coefficients differ across countries heteroscedasticity results. The OLS estimate of the average coefficient value across countries will be unbiased, although the standard errors will be biased (Engen and Skinner, 1988).



payments to the government. Instead, the efficiency costs stem from the efforts of taxpayers to avoid paying money to the government, whether it is consuming less of the taxed good, producing less of the taxed good, smuggling, or just evading taxes. The purpose of this paper has been to illustrate with historical and more recent examples the efficiency costs of taxation. Each type of tax (labor, capital, property) was shown to have particular disincentive effects, which, if the tax rates were sufficiently high, could be dramatic. In other cases, the impact of taxation was less clear; in particular, the effectiveness of investment tax incentives (which reduce the tax on business investment) is not well established.

A second approach for testing how taxes affect economic activity is to examine whether countries with different tax structures grow at different rates. That is, do we find that, conditioning on other factors such as investment growth, government expenditures, and population, do countries with high tax rates grow faster or slower than countries with low tax rates. Of course, this type of analysis must be interpreted with caution, owing to the difficulties in cross-country comparisons.

In conclusion, the efficiency cost of taxation is often difficult to detect, and often takes a back seat to political considerations in tax policy. It is true that when tax rates are low, they may have little impact on economic behavior, and as a consequence entail little efficiency cost. When tax rates are extremely high, even the most economically ignorant observer notes the large efficiency costs of the tax. It is when taxes are

moderately distorting, and the effects, though substantial, are difficult to detect, that taxes have the greatest potential for damage.

## Bibliography

Auerbach, Alan, Laurence Kotlikoff, and Jonathan Skinner, "The Efficiency Gains from Dynamic Tax Reform", International Economic Review, (February 1983).

Azhar, B. A., and S. M. Sharif, "The Effects of Tax Holiday on Investment Decisions: An Empirical Analysis," Pakistan Development Review (1974) pp.409-32.

Bolnick, Bruce, "Demographic Effects on Tax Ratios in Developing Economies," Journal of Development Economics 5 (1978) pp. 283-306.

Boskin, Michael J., "Taxation, Saving, and the Rate of Interest," Journal of Political Economy (April 1978): pp. S3-S27.

Boskin, Michael J., and William G. Gale, "New Results on the Effects of Tax Policy on the International Location of Investment," NBER Working Paper # 1862 (March 1986).

Ballard, Charles L., "Marginal Welfare Cost Calculations," mimeo (1987).

Ballard, Charles L., D. Fullerton, J.B. Shoven, and J. Whalley, A General Equilibrium Model for Tax Policy Evaluation. Chicago: University of Chicago Press (1985).

Billsborrow, R. E., and R.C. Porter, "The Effects of Tax Exemptions on Investment by Industrial Firms in Colombia," Weltwirtschaftliches Archiv (1972): pp. 396-425.

Brent, Robert J., "Lagged Reactions in Short-Run Estimates of Tax Shifting of Company Income and Sales Taxes in Kenya," Journal of Development Economics 20 (1986): pp. 15-32.

Browning, Edgar K., "The Marginal Cost of Public Funds," Journal of Political Economy (April 1976): pp. 283-98.

Browning, Edgar K. "On the Marginal Welfare Cost of Taxation," American Economic Review (March 1987): pp. 11-23.

Chamley, Christophe, "Taxation in Dynamic Economies: Some Problems and Methods," mimeo, World Bank, CPDRM (October 1983).

Chamley, Christophe, "The Welfare Cost of Capital Income Taxation in a Growing Economy," Journal of Political Economy (June 1981): pp. 468-96.

Chen-Young, P. A., "A Study of Tax Incentives in Jamaica," National Tax Journal (1967): pp. 292-308.

Dahl, Henrik, and Pradeep K. Mitra, "Taxes, Tariffs and Trade in an Industrializing Low Income Country: Simulating Policy Changes in India, 1973-74 - 1983-84," (November 1986) mimeo, World Bank.

deMelo, J., "Estimating the Costs of Protection: A General Equilibrium Approach", Quarterly Journal of Economics (1978), pp. 209-226.

Engen, Eric, and Jonathan Skinner, "Government Size, Economic Growth, and Taxation," mimeo (May 1988).

Evans, Owen, "Tax Policy, The Interest Elasticity of Saving, and Capital Accumulation," American Economic Review (June 1983): pp. 398-410.

Feder, Gershon, "On Exports and Economic Growth", Journal of Development Economics 12 (1982) pp. 59-73.

Feenberg, Dan, and Jonathan Skinner, "Sources of IRA Saving," in L. Summers (ed) Tax Policy and the Economy 3. Cambridge: MIT Press (1989).

Feldstein, Martin, and Horioka, Charles, "Domestic Saving and International Capital Mobility," Economic Journal (June 1980): pp. 314-329.

Fields, Gary, "Public Policy and the Labor Market in Developing Countries," in Newbery and Stern (eds.) The Theory of Taxation for Developing Countries. New York: Oxford University Press and the World Bank (1987).

Frankel, Jacob, and Assaf Razin, "Fiscal Policy and the World Economy". Cambridge, MA: MIT Press (1988).

Fullerton, Don, "On the Possibility of an Inverse Relationship Between Tax Rates and Government Revenues," Journal of Public Economics (October 1982).

Harris, J. R., and M. P. Todaro, "Migration, Unemployment, and Development: A Two-Sector Analysis," American Economic Review (March 1970): pp. 126-42.

Hartman, David, "Tax Policy and Foreign Direct Investment in the United States," National Tax Journal (1984): pp. 475-87.

Henderson, J.M., "Optimal Factor Allocation for Thirteen Countries", in A.O. Krueger, ed. Trade and Employment in Developing Countries (2). Chicago: University of Chicago Press (1982).

Hossain, Hossain, Atiur Rahman, and M. M. Akash, "Agricultural Taxation in Bangladesh: Potential and Policies," Bangladesh Institute of Development Studies (October 1985).

Howrey, Philip, and Saul Hymans, "The Measurement and Determination of Loanable Funds Savings," Brookings Papers on Economic Activity (1978): pp. 655-85.

Kemal, A. R., "The Effect of Tax Holiday on Investment Decisions: Some Comments," Pakistan Development Review (1975): pp. 245-48.

Killingsworth, Mark, Labour Supply. Cambridge: Cambridge University Press (1983).

Koester, Reinhard, and Roger Kormendi, "Taxation, Aggregate Activity and Economic Growth: Cross-Country Evidence on Some Supply-Side Hypotheses," Economic Inquiry (forthcoming).

Kotlikoff, Laurence, "Social Security: Time to Reform," in M Boskin (ed.) Federal Tax Reform: Myths and Realities. Institute for Contemporary Studies (1978).

Kotlikoff, Laurence, "Taxation and Savings: A Neoclassical Perspective," Journal of Economic Literature (December 1984): pp. 1576-1629.

Krueger, Anne O., "Trade Policies in Developing Countries", in R. W. Jones and P. B. Kenen, eds. Handbook of International Economics, Elsevier Science Publishing (1984).

Landau, Daniel, "Government Expenditures and Economic Growth: A Cross-Country Study," Southern Economic Journal 49 (January 1983): pp. 783-92.

Landau, Daniel, "Government and Economic Growth in the Less Developed Countries: An Empirical Study for 1960-80," Economic Development and Cultural Change (October 1986): pp. 35-75.

Leamer, Edward, Specification Searches: Ad Hoc Inference with Nonexperimental Data. New York: Wiley (1978).

Lindauer, David L., "The Size and Growth of Government Expenditures," WDR (1988) Background Paper (1987).

Lindsey, Lawrence, "Capital Gains: Rates Realization and Revenue," Journal of Public Economics (1987).

Lucas, Robert E., "On the Mechanics of Economic Development", mimeo, University of Chicago (1985).

Manas-Anton, Luis A., "Structure of Taxation and Growth in Developing Economies", Mimeo, IMF Fiscal Affairs Department (September, 1985).

Marsden, Keith, "Links Between Taxes and Economic Growth: Some Empirical Evidence," World Bank Staff Working Paper #605, (August, 1983).

Martin, Ricardo and Moshen Fardmanesh, "Fiscal Variables and Growth: A Cross Sectional Analysis," mimeo (1987).

Mathias, P., and P. O'Brien, "Taxation in Britain and France," Journal of European Economic History 5.

McCulloch, John R. A Treatise on the Principles and Practical Influence of Taxation and the Funding System. London: Longman, Brown, Green, and Longmans (1845).

Mikesell, Raymond F., and James E. Zinser, "The Nature of the Savings Function in Developing Countries: A Survey of the Theoretical and Empirical Literature," Journal of Economic Literature (March 1973): pp. 1-26.

Mitchell, Sidney K., Taxation in Medieval England. Archon Books (1970).

Mutti, John, and Grubert, Harry, "The Taxation of Capital Income in an Open Economy: The Importance of Residence-Nonresident Tax Treatment," Journal of Public Economics (August 1985): pp. 291-309.

Newlyn, W.T., "Measuring Tax Effort in Developing Countries," Journal of Development Studies (April 1985): pp. 390-405.

Ram, Rati, "Government Size and Economic Growth: A New Framework and Some Evidence from CrossSection and TimeSeries Data," American Economic Review 76 (March 1986a) p. 191-203.

Ram, Rati, "Causality Between Income and Government Expenditure: A Broad International Perspective," Public Finance/ Finances Publiques (1986b) pp. 393-413.

Ram, Rati, "Wagner's Hypothesis in TimeSeries and CrossSection Perspectives: Evidence from 'Real' Data for 115 Countries," Review of Economics and Statistics (May 1987): pp. 194-204.

Robinson, Sherman, "Sources of Growth in Less Developed Countries: A Cross-Section Study", Quarterly Journal of Economics (1971) pp. 391-408.

Sabine, B. E. V., A Short History of Taxation. London: Butterworths (1980).

Shah, S. M. S., and J. F. J. Toye, "Fiscal Incentives for Firms in Some Developing Countries: Survey and Critique," in Toye (ed.). Taxation and Economic Development. London: Frank Cass (1980).

Shoven, John B., and John Whalley, "Applied General Equilibrium Models of Taxation and International Trade," Journal of Economic Literature (September 1984): pp. 1007-1051.

Skinner, Jonathan, "The Welfare Cost of Uncertain Tax Policy," Journal of Public Economics (forthcoming, 1989).

Skinner, Jonathan, "Taxation and Output Growth: Evidence From African Countries," NBER Working Paper No. 2335 (August 1987).

Skinner, Jonathan, "Risky Income, Precautionary Savings, and Life Cycle Consumption," Journal of Monetary Economics (1988).

Slemrod, Joel, and Nikki Sorum, "The Compliance Cost of the Individual Income Tax System," National Tax Journal (December 1984): pp. 461-474.

Smith, Adam. The Wealth of Nations. Chicago: University of Chicago Press (1976).

Standford, G. R., and J.B. Christensen, Tax Incentives for Industry in Mexico. Harvard Law School (1959).

Stewart, Douglas B. and Yiannis P. Venieris, "Sociopolitical Instability and the Behavior of Savings in Less-Developed Countries", Review of Economics and Statistics, (November, 1985), pp. 557-63.

Stoate, T. L., Cornwall Hearth and Poll Taxes 1660-1664. Privately Printed by T. L. Stoate, Lower Court, Almondsbury, Bristol.

Summers, Robert, and Alan Heston, "Improved International Comparisons of Real Product and Its Composition," Review of Income and Wealth (June 1984): pp. 207-262.

Tanzi, Vito, "Quantitative Characteristics of the Tax Systems of Developing Countries," in D. Newbery and N. Stern (eds.) The Theory of Taxation for Developing Countries. New York: Oxford University Press (1987).

Venti, Stephen F., and David A. Wise, "Have IRAs Increased U.S. Saving?: Evidence From Consumer Expenditures Surveys," NBER Working Paper No. 2217 (April 1987).

Webber, Carolyn, and Aaron Wildavsky. A History of Taxation and Expenditure in the Western World. New York: Simon and Schuster (1986).

World Bank, World Tables (3rd ed.), Baltimore: Johns Hopkins University Press (1984).

World Bank, The World Development Report. New York: The Oxford University Press (1986).



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